Dupuytren's Contracture of the Fingers

A Simplified Approach to the Surgical Treatment

RICHARD I. GONZALEZ, M.D., *San Mateo*

■ *Hematoma formation, delay in healing, pain, stiffened finger joints are complications that sometimes follow classical surgical approaches to Dupuytren's contracture. A new surgical approach to the disease that can correct the contractures without the attendant morbidity is urgently needed. By treating Dupuytren's as any other scar contracture (division of the contracting soft tissue at its point of maximal tension and interposing normal free full-thickness skin) postoperative morbidity can be greatly decreased. Full return of function was achieved within 21 days following operation in 85 percent of the cases in which finger contractures were present before operation. Contracture release of 100 joints was done by this means, with loss of only one graft and without recurrence of the disease. This technique offers simple surgical control of progressive and recurrent Dupuytren's contracture of the fingers with minimal postoperative morbidity.*

POSTOPERATIVE MORBIDITY—delayed healing, joint stiffness and pain – following the surgical treatment of Dupuytren's contracture, is well known. As Howard[1] has stated, "The only major problem in the surgical treatment of Dupuytren's contracture is the prevention of postoperative stiffness of the small finger joints." And as Shaw and Barclay[2] noted, "The overriding consideration leading to a successful result is to restore a healed hand to normal use within three weeks of operation." The degree of postoperative morbidity, in my experience, has been almost proportionate to the extent of the surgical procedure: The more extensive the procedure, the greater the morbidity. The simplest surgical procedure, subcutaneous fasciectomy, carries very little morbidity; but in my experience, in progressive disease it provides only temporary relief of the contracture. However, radical palmar fasciectomy with or without finger dissection, though carrying a high degree of postoperative morbidity, does not guarantee prevention of recurrence. In 1951 Hamlin[3] recognized this seeming enigma and advocated limited palmar fasciectomy in the hope of reducing postoperative morbidity. He recommended excision of the diseased fascia alone and was able to return his patients to "usual occupation" 12 to 30 days after operation, in contrast to the average of 118 days following the classical radical fasciectomy.

In Hamlin's report, however, there was no indication as to the extent of finger contractures against localized palmar involvement. In 1961 Hueston[4] reported on a larger series of patients

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Reprint requests to: 101 South San Mateo Drive, San Mateo, Ca. 94401 (Dr. R. I. Gonzalez).

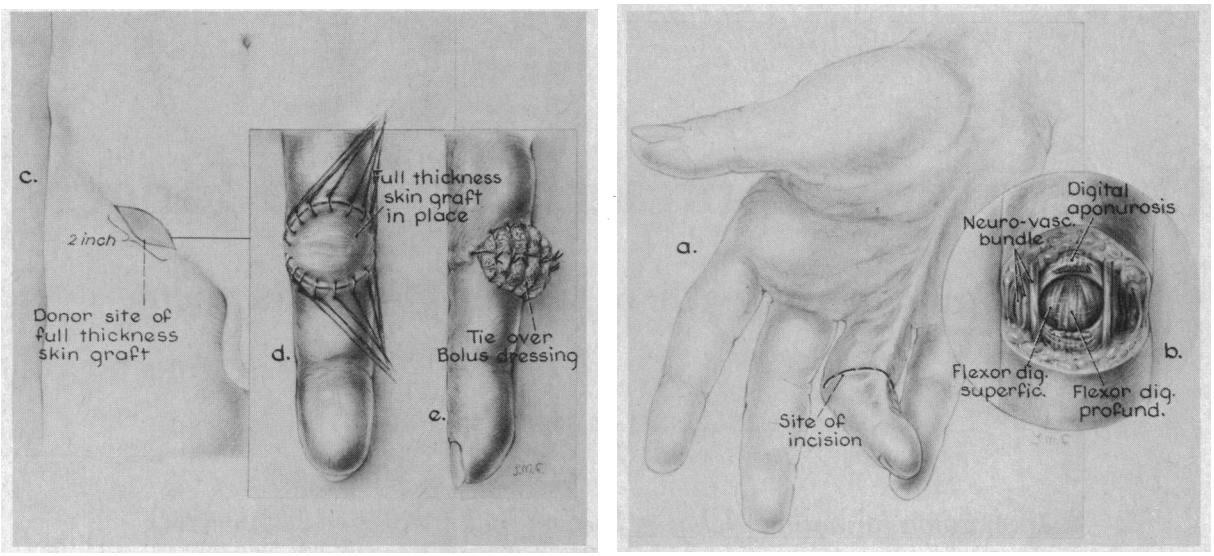

Figure 1.—Technical steps in the release of Dupuytren's contracture, utilizing inset of full thickness skin grafts.

a) *Step 1.* Transverse skin incision across point of maximal tension.

b) *Step 2.* Before subcutaneous fascial band is cut the neurovascular bundles are identified, mobilized and protected. These bundles are often out of their normal anatomical position and may be hidden within the fascial band.

c) *Step 3.* A full thickness skin graft is taken from a hairless area overlying the inguinal ligament. The skin in this area is quite thin and the resultant donor defect is easily closed by a simple continuous suture, particularly if a bottom layer of partial thickness of dermis is left in depths of donor area.

d and e) *Step 4.* The free full skin graft is carefully sutured in place with interrupted 3-0 black silk sutures which are left long and tied over a bolus of wet cotton. Care should be taken to tie the sutures in the vertical direction only, for tightly tied transverse sutures may compromise the blood supply of the dorsal skin bridge. The finger is immobilized in the extended position by a padded volar plaster splint. Uninvolved fingers are left free, and early motion encouraged. The bolus is removed at seven days and the skin sutures at ten days. Active motion is encouraged after the removal of the bolus dressing.

for whom local fasciectomy plus multiple Z-plasty had been used to lengthen the secondarily shortened volar skin over the contracted fingers. Twelve and a half percent of these patients recovered full flexion within three weeks, and 84.5 percent within six weeks after operation. In neither series was recurrence a major problem. In the hope of further reducing postoperative morbidity and approaching the ideal of full return of function within three weeks, I substituted inset full-thickness skin grafts for Z-plasty to overcome volar finger skin shortness. By transecting the contracting fascial band and skin at its point of maximal tension and inserting full-thickness skin grafts into the defect, dissection and undermining is kept to a minimum and healing and return of function is rapid. The use of full-thickness skin grafts as an adjunct to the treatment of Dupuytren's contracture is not new. Gordon,[5] Skoog[6] and Hueston[4] have all recommended the use of Wolff grafts for replacement of avascular palmar skin. However, no one to my knowledge has used them as insets or additions to lengthen shortened skin. I have released 100 contracted finger joints in this manner over the past 11 years. In 85 percent of cases full flexion and extension were restored within 21 days after operation and to date there have been no recurrences of the contractures.

Technique

Under either general or local anesthesia, the point of maximal tension of the contracting band is marked and a transverse skin incision is made to each mid-lateral line (Figure 1, a) The neurovascular bundles (Figure 1, b) are identified and mobilized by spreading longitudinally with sharp-pointed scissors. After the bundles are well visualized, all fascial bands are totally divided transversely. This usually permits complete extension of the finger. Shortened volar joint capsules may restrict full extension but are best mobilized postoperatively by the use of a dorsal clock-spring splint and not by capsulotomy. The proximal palmar remnant of the fascial band can be excised through short vertical or transverse incisions. This step can be elim-

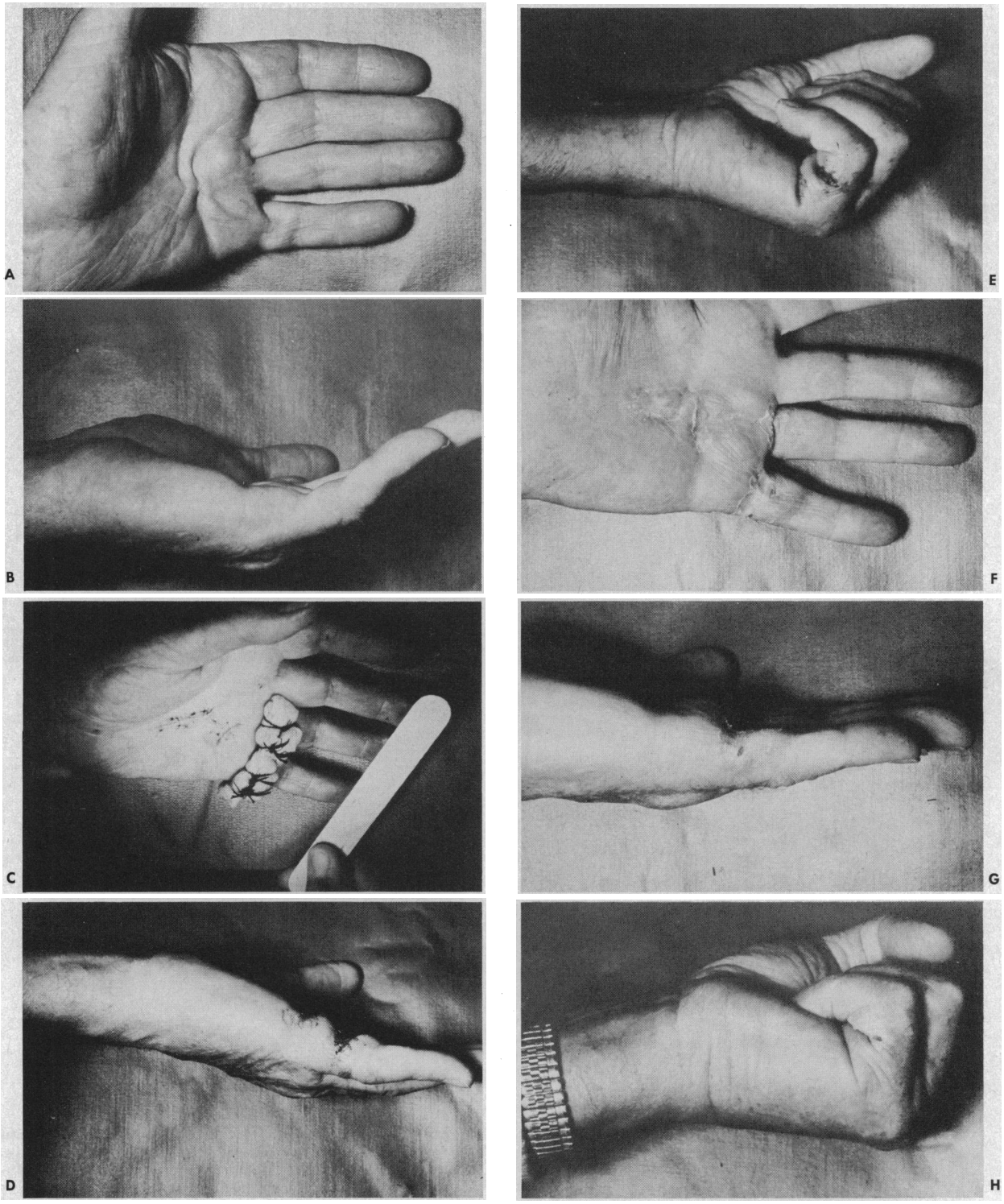

Figure 2.—Preoperative condition in a 57-year-old male (A and B). There is a moderate contracture at the proximal joints of the left long (−42°), ring (−40°) and little (−30°) fingers. The little finger also lacks 17° at the middle joint. Contracture of this type could adequately be treated by conventional palmar fasciectomy, however, by utilizing inset full thickness skin grafts plus limited fasciectomy under local anesthesia (C), the release of the contracture was accomplished with minimal operative and postoperative morbidity. Pictures D and E demonstrate the range of motion immediately after the removal of the skin sutures (ten days after operation). Pictures F, G and H show range of motion 20 days after operation. The full thickness skin grafts were taken from the instep of the foot. There has been no recurrence of progression of the disease since operation (21 months).

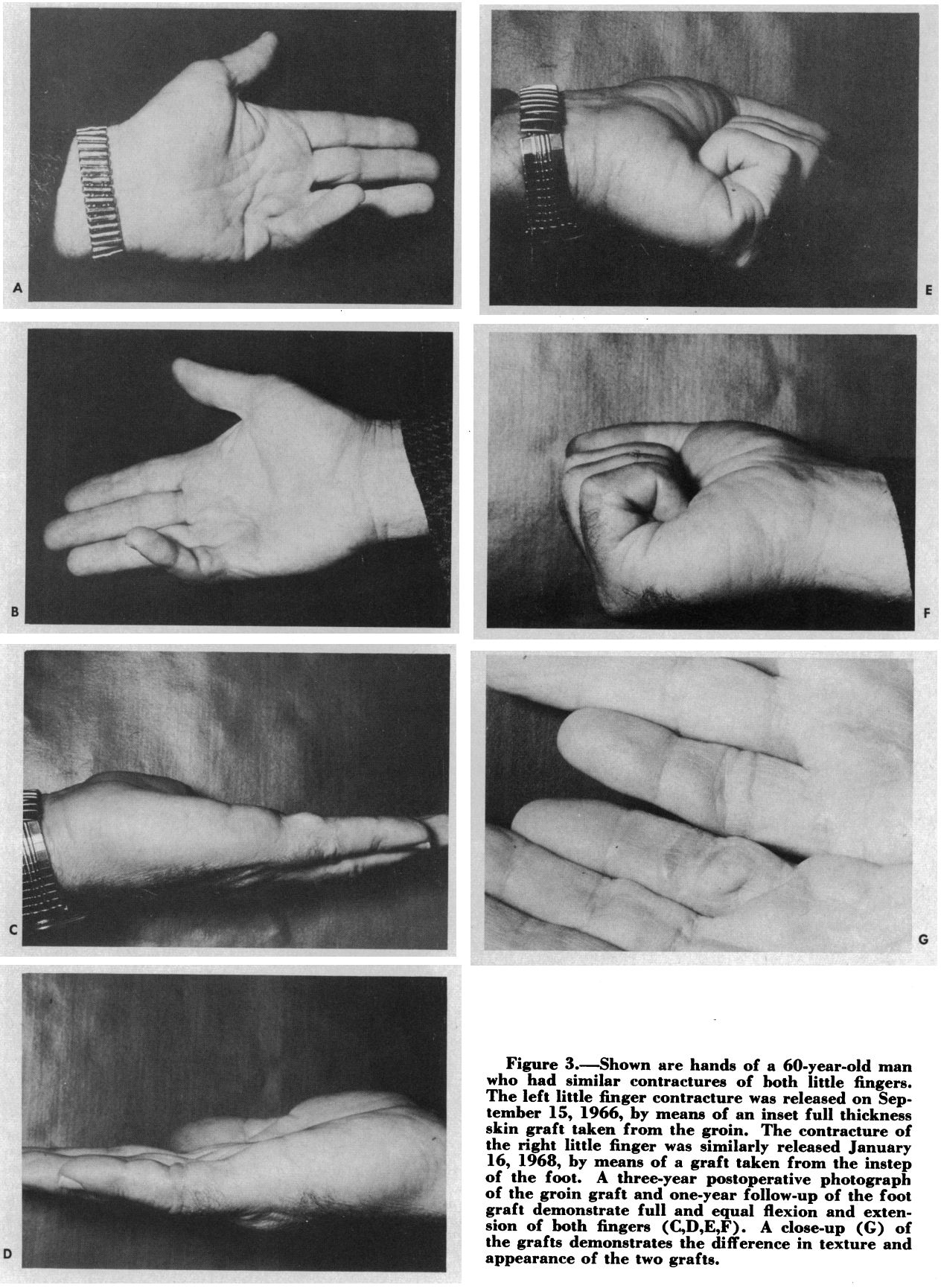

Figure 3.—Shown are hands of a 60-year-old man who had similar contractures of both little fingers. The left little finger contracture was released on September 15, 1966, by means of an inset full thickness skin graft taken from the groin. The contracture of the right little finger was similarly released January 16, 1968, by means of a graft taken from the instep of the foot. A three-year postoperative photograph of the groin graft and one-year follow-up of the foot graft demonstrate full and equal flexion and extension of both fingers (C,D,E,F). A close-up (G) of the grafts demonstrates the difference in texture and appearance of the two grafts.

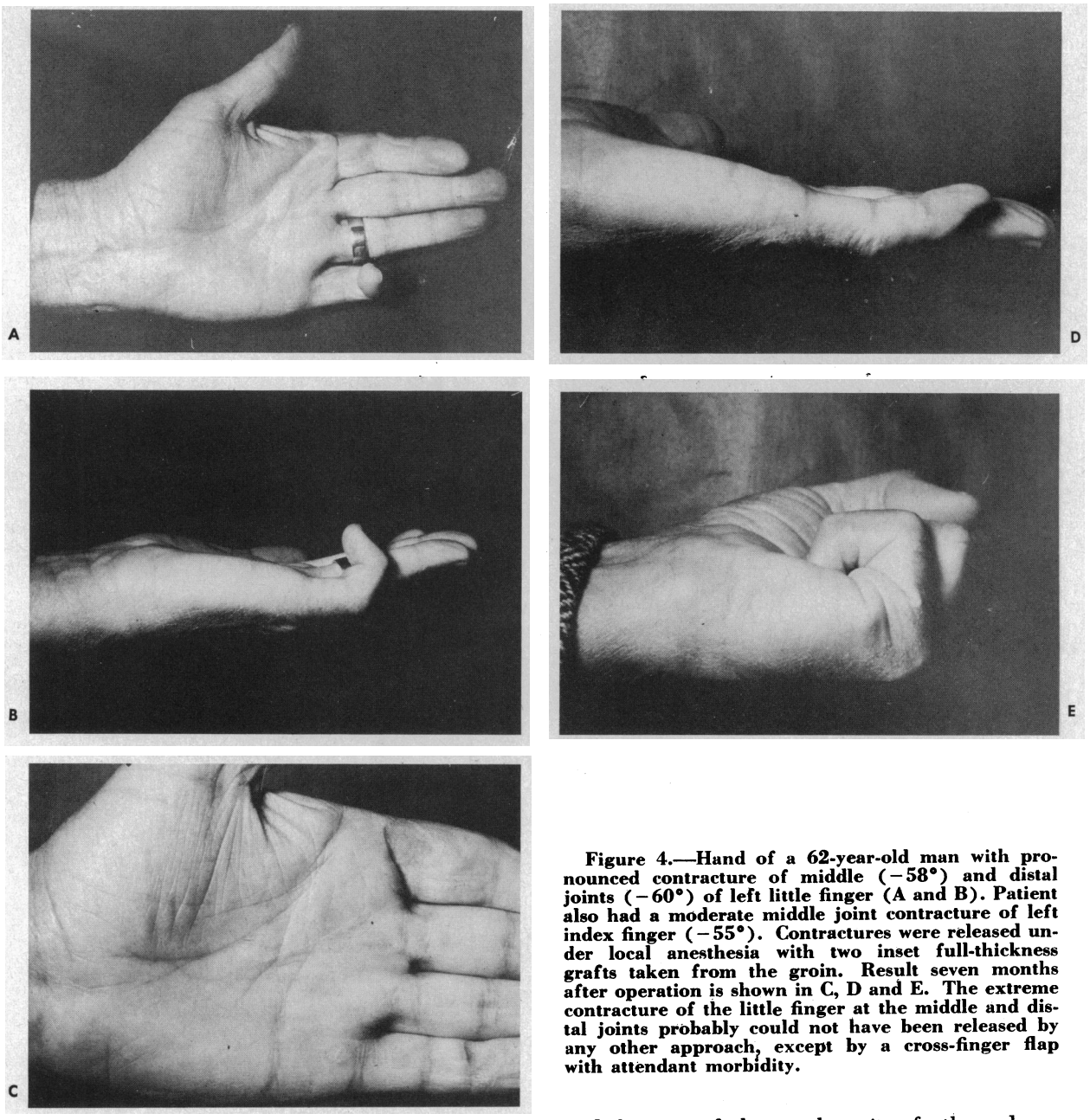

Figure 4.—Hand of a 62-year-old man with pronounced contracture of middle (−58°) and distal joints (−60°) of left little finger (A and B). Patient also had a moderate middle joint contracture of left index finger (−55°). Contractures were released under local anesthesia with two inset full-thickness grafts taken from the groin. Result seven months after operation is shown in C, D and E. The extreme contracture of the little finger at the middle and distal joints probably could not have been released by any other approach, except by a cross-finger flap with attendant morbidity.

inated without jeopardizing the end result, as remnants of the released fascial bands soften and largely disappear.

The site of operation is then changed to the donor site (Figure 1, c)—either the groin or instep of the foot. Foot skin most resembles finger skin in texture, color and thickness. However, the size of the graft that can be taken from the instep is limited unless one is willing to split-graft the donor site. Another disadvantage of using the foot as a donor site is the necessity to restrict weight-bearing until healing is complete. The groin is a better donor site for large grafts, and the ease of closure there is a further advantage. One disadvantage is hyperpigmentation of the skin in that area, particularly in dark-skinned patients. If one leaves a thin layer of dermis in the base of the donor site, closure is greatly facilitated and undermining is not necessary. Quite large donor areas can be closed with a simple running suture. The skin for grafting should be taken from the lateral aspect of the groin, as there are few hair follicles there. The free graft is carefully sutured into the denuded area of the finger (Figure 1, d)

The sutures are placed 2 to 3 mm apart, are

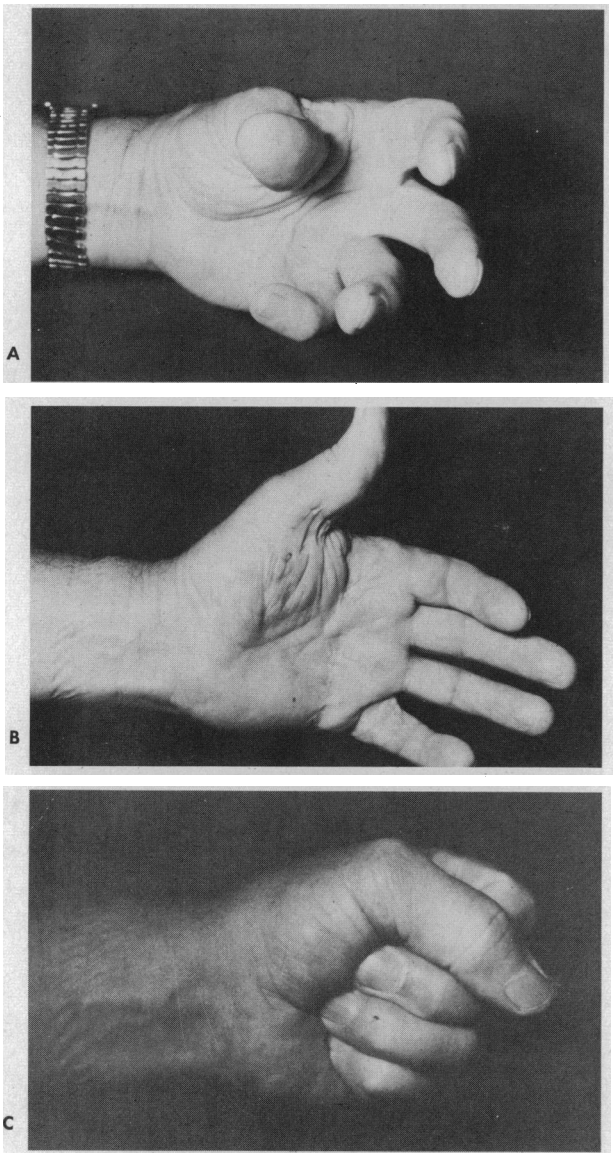

Figure 5.—Hand of 67-year-old man who had contracture of the first cleft and all the fingers of his left hand (A). The contractures were released by three full-thickness inset grafts and a limited palmar fasciectomy under local anesthesia with full recovery of function (B and C). Usually there is little if any functional disability in Dupuytren's contracture. However, when there is involvement of the first cleft, opening of the hand for grasp is limited.

left long and are tied over a bolus of wet cotton (Figure 1, e) Postoperative bleeding, hematoma formation or "graft take" have not been problems. However, if a graft does not take, an immediate cross-finger flap is necessary to protect the exposed flexor tendons. A volar plaster splint is incorporated in the dressing, to keep the finger at rest. The bolus is removed at seven days and skin sutures at ten days.

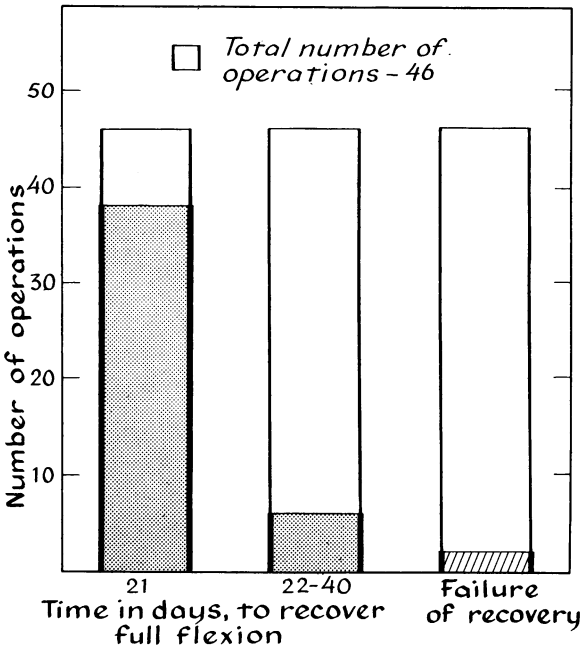

Chart 1

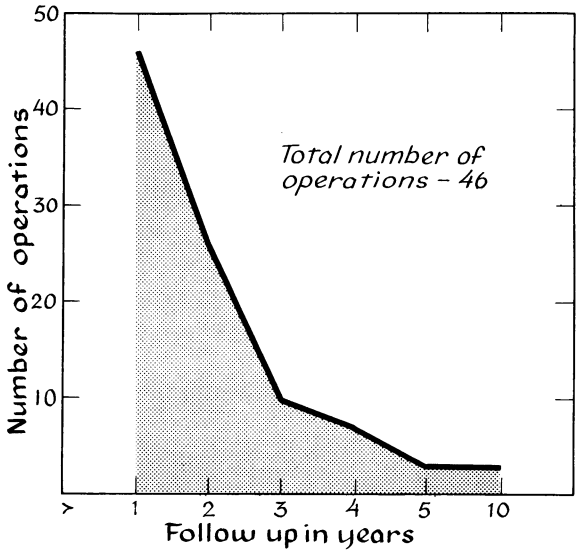

Chart 2

Supervised active exercises are carried out until full flexion and extension are achieved. To achieve maximal flexor power in the small finger joints, the patient should stabilize each finger joint by firmly holding the finger just proximal to each joint and vigorously contracting the flexor musculature. Only by such vigorous exercise can early return of full flexion be achieved. It is the physician's responsibility to make certain that these exercises are carried out continuously and properly.

TABLE 1.—*Clinical Data on 39 Patients with 46 Operations for Release of 100 Finger Joints*

Patients	39
Male	30
Female	9
Age range (years)	18–91
Average age	58.6
Past History	
Arthritis	19
Bursitis	12
Heart "trouble"	5
Family History of Dupuytren's Contracture	12
Maternal	6
Paternal	6
Previous Rx Treatment	
Surgical	17
Xradiation	1
Cortisone	1
Ultra sound	1
Distribution of Disease	
Palm	31
Thumb	6
Index finger	4
Long finger	12
Ring finger	17
Little finger	34
Contracted Joints	
Proximal joint	46
Average lack of extension	−46°
Middle joint	44
Average lack of extension	−49°
Distal joint	10
Average lack of extension	−33°
Total Number of Operations	46
Type of Operation	
Limited palmar fasciectomy plus full thickness skin grafts (finger)	31
Full thickness skin grafts only (finger)	15
Donor Sites	
Groin	48
Foot	12
AnteCubital Fossa	3
Total free full thickness skin grafts	63
Anesthesia	
General	27
Local	15
Operative Results	
Postoperative morbidity (Chart 1)	
Recovery full flexion 21 days after operation	38 (83%) Figure 3
Recovery full flexion 40 days after operation	44 (96%)
Recurrence	0
Progression	0
Follow-up (years)	
Average (Chart 2)	3.5
Range	1.5 to 11.5
Complications	
Nerve damage	0
Hematoma	0
Infection with loss of graft	1

This series (details in Table 1) demonstrates the usual sex and age distribution as well as the association of Dupuytren's contracture with other forms of coexisting collagen disease. The high incidence of previous surgical treatment indicates the applicability of this technique to recurrent or progressive Dupuytren's contracture. The low incidence of palmar involvement is a reflection of the fact that no cases of palmar involvement without finger joint contractures were included in this series.

Discussion

Most grafts healed well within ten days following operation. In a few there was delay in healing of the superficial layers of the graft. This did not interfere with the beginning of vigorous active exercises. In thirteen cases full flexion was achieved immediately after the bolus and sutures had been removed from the grafts (ten days). One full-thickness skin graft was "lost" due to hemorrhage and secondary infection. This was in an alcoholic woman who broke the splint on her hand in a fall three days after operation, and as she did not return for postoperative visits the accident was not discovered. In this case both tendons and neurovascular bundles sloughed. It is probable that if a cross-finger flap had been placed on the exposed tendons soon enough, the function of the finger could have been preserved. One other patient, although improved, did not recover full flexion and extension of his finger. He was a 91-year-old man whose little finger had been firmly flexed into his palm for 25 years. The middle joint did not respond to postoperative splinting.

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